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ABSTRACT

The learning center is a place for using and storing materials that relate to a special interest or curriculum area. It is a place where the students, after consulting with the teacher, may go to work; where ideas, materials, and activities are presented on a variety of levels of difficulty. Teachers, however, must first decide what the role of the learning center will be in their instructional program. Are they going to use the center primarily for remediation, enrichment, motivation, short courses, or as the major instructional strategy? There are many themes a center might have: a theme on the study of flight could include an exploration of bird wings (identification of bones and their functions, statistical tables of length and weight) and the making and testing of paper airplanes; a listening and viewing center could be set up for students to view examples of flight and then discuss what they have seen. (An appendix is included that describes and graphically outlines a variety of learning centers.) (JB)

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THE LEARNING CENTERS APPROACH TO INSTRUCTION

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THE LEARNING CENTERS APPROACH TO INSTRUCTION

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PREFACE

There has been much talk by many people—friends and foes of education—about *why* teachers should: individualize/personalize instruction, provide students with the opportunity to work independently, and provide them opportunities to make decisions. However, there has *not* been much positive/concrete help given to teachers as to *how* they should accomplish these highly desirable objectives.

In this FERDC Bulletin on Learning Centers I believe we have some ideas on how teachers may accomplish the above mentioned objectives in their classroom.

The Bulletin was written by people who are interested in providing practical help to busy teachers. On behalf of our members, I thank them for the excellent work they have done.

Dr. Wm. F. Breivogel
Executive Secretary

Fall, 1973

TABLE OF CONTENTS

WHAT IS A LEARNING CENTER? 4
- A Definition 4
- Characteristics of a Learning Center 4

HOW DO I USE LEARNING CENTERS? 6
- Enrichment Stations 6
- Reinforcement Center 6
- Motivation Station 7
- Remediation and Self-Correction Center 7

WHY SHOULD I TRY LEARNING CENTERS? 7

HOW DO I GET STARTED? 10
- Center Directions 12
- Learning Center Study Guide 12
- Further Guidelines 14

COULD YOU GIVE AN EXAMPLE? 15
- Activities 15
- Listening and Viewing Area 19
- Introducing the Center 20
- Records of Student's Work 20
- Assessment of Student Achievement 22
- Center Suitability 23

SUMMARY 24
- Appendix 25

BIBLIOGRAPHY 29
- ERIC 30

INTRODUCTION

To say that there has been a revolution in the teaching strategies used in American public school classrooms is, at the very least, an understatement. New methods of facilitating learning appear almost faster than they can be catalogued, certainly faster than individual classroom teachers can absorb their significance. Some methods disappear almost as rapidly as they appear.

The continued use of a particular teaching-learning method seems to depend in part on whether it is correlated with current ideas and directions in educational theory. Survival of a teaching method also depends upon whether teachers can easily put it to use in their classrooms and achieve the desired results. The Learning Centers approach seems to be one of the recent innovations destined to grow and to become a permanent part of the repetoire of a significant portion of American teachers.

As one of only a few successful strategies aimed largely at the popular and desirable goal of individualized instruction, the use of learning centers is spreading through elementary and middle schools across the nation. Because of this rapid spread, and because of the existence of other closely related and similarly named classroom strategies, some confusion exists as to the correct definition of the term "learning center." It is important, because of this confusion, to clarify the relationship of the learning center to other similar ideas and to distinguish their various uses. The first task is to define and describe a learning center.

What Is A Learning Center?

A Definition

In this bulletin a learning center refers to an area for study and activity, in or near the classroom, that has been provided for the structured exploration of a particular subject, topic, skill, or interest. It is a place for using and storing materials that relate to a special interest or curriculum area. It may be in a corner, on a wall, next to a bookcase, or on a table; but it exists somewhere in the physical space of the classroom or school.

The learning center is not to be confused with Learning Resource Center, a term now used to describe a larger central area housing the combined contents of the school library, the media center, and other areas which previously served as repositories for learning materials shared by teachers and students on a school-wide basis. Nor should the learning center or station be confused with the term "learning laboratory" when that term is used to describe a larger area (usually a small room) devoted to the study of one particular subject. Language labs and math labs are good examples of the "learning laboratory" in its own room, containing a multitude of math or language games, films, tapes, problems, texts, and other materials. Typically, the laboratory is not organized for specific learner tasks or activities, serving usually only as a source of materials used, once again, by a number of teachers who may have had little or nothing to do with their construction.

Some teachers and writers in the field use the term "learning station" as a synonym or in the place of learning center. We have chosen to use the latter term in this paper only because it is the term more commonly used by teachers.

Characteristics of a Learning Center

One important characteristic of a learning center is that it is auto-instructional. That is, it does not, when properly designed, demand the direct and continuous presence of the teacher as an information-giver. Pupils, after consulting the teacher, may go directly to a learning center and begin work. Each center

should have clear, easily-discovered objectives and plainly written directions for beginning and completing work.

Secondly, each center (or station, if you wish) can present ideas, materials, and activities on a variety of levels of difficulty. Individualization is the key, and each learning center should also allow the student some choice in the direction he wishes to go. Each center can present its tasks with different versions and different ability levels.

Third, at the learning center each student should be asked to achieve specific objectives which are clearly communicated. The directions must specify the nature of the task and exactly what "exit behavior" is required. When objectives, alternate pathways, and post tests are clearly communicated, students are able to move through the center with a minimum of direct intervention from the teacher.

Fourth, each center must include a method of recording the student's participation. The teacher may provide an individual folder for each student. This folder can be stored with others in an area removed from the centers but convenient to both teacher and students. Students are able to make additions to their folder when needed and the teacher also has easy access to pupil records. When such progress-charting is done consistently, students may proceed from term to term, and even from one year to the next, with a minimum of disruption.

Another characteristic of the effective learning center, related to record keeping, is the inclusion of opportunities for pupil assessment in each center activity. Ideally, each center will have, for each activity, a pre-assessment and post-assessment which students can administer to themselves or each other without the presence of the teacher. Depending upon the teacher's preference, students may even check their own work or they can deposit the assessment records in their folders where the teacher will go to review them.

Each center involves the opportunity for student decision-making and steps toward independent learning. Optimally, students have the opportunity to choose from among a variety of objectives and in at least a small way help to determine their own goals. "Contracting" with teachers on the path to be followed can become an important aspect of this process. Ideally, a learning centers approach should enable students to help make the decisions on the following questions:

When and where should I learn?
How should I manage my time?
Which resources should I use?
What are my goals?
How do I know when I have learned?
Who will evaluate my work?

How Do I Use Learning Centers?

A wide variety of uses for learning centers have now evolved. Teachers may use learning centers for one purpose or for a variety of tasks. One of the more traditional uses of the learning center has been in the sense of an "interest center" where students may go when their regularly assigned tasks are completed. Usually the experiences of the interest center have only a minimum of direct relationship to the major instructional objectives. Using the learning center as a place where fast working students while away their time waiting for others to catch up is not the most desirable use of the learning center. It can be done, however, in a way that becomes quite profitable.

Enrichment Stations

Learning centers can be used as "enrichment stations" where students may go for additional work on a particular topic, skill, etc. This use of the learning center need not be restricted to only the brightest students in the class. It can serve as an excellent change of pace for students working at any ability level.

Reinforcement Center

A related use of the learning centers approach is when it is employed as a "reinforcement center." This center usually operates as a supplement to small or large group teacher-led activities. Students may go to a reinforcement center in grammar, for example, after a small group lesson with the teacher. At the center students find a variety of games, problems, readings, etc., that strengthen the concepts introduced by the teacher in the larger group.

Motivation Station

Another "part-time" use of the learning center is as a "motivation station." Here teachers introduce new units of study, new topics for investigation, etc. The center may be used as a "kick-off" device for the new unit. Teachers, if they choose, may also use this learning center as a culminating activity for wrap-up effects, looking back at what has been accomplished and forward to new ideas and implications.

Remediation and Self-Correction Center

The learning center may be used as a "remediation and self-correction center." Here students come when they need a booster shot in some subject or skill. They may come to the center on their own, at the teacher's direction, or be directed as the result of making particular choices at another learning center. They may, for example, choose an activity or experiment which demands certain skills as prerequisites. The directions of that particular activity should clearly specify that prerequisite skill and the source of remediation at the self-correction center.

The learning center may also be used for the development of those skills of continued learning which teachers rarely find time to deal with in the course of the regular day. A center may, for example, be used to teach the skills and responsibilities of independent learning and self-reliance. A complementary center may then be designed to provide "short courses" for independent learners.

The most important and far reaching use of the learning centers approach, however, is its use as the major method of instruction. It is this use of the learning center that will comprise the largest part of the remainder of this Bulletin.

Why Should I Try Learning Centers?

The learning center approach to class structure has as its major goal the increased personalization of instruction. There are several ways in which it works toward realization of this goal. First it provides instruction at a variety of ability levels,

allowing students to choose the level most appropriate to them. In this way the teacher can "precipitate the student into just-manageable difficulty." The student, in other words, will be able to work at the level which demands as much as the student has to give but no more. In addition to exercising some choice in the direction of his work, the learning center also permits the student to work at his own pace. He does not need to wait for others or to go faster than the speed at which he works best.

The learning center takes an important step toward another related desirable educational goal, the development of self-initiating learners. We know that to live constructively, now and in the future, persons must be capable of recognizing the need for their own personal learning. They must, in addition, be predisposed to initiate that learning and possess the ability to do so.

This kind of active involvement in lifelong learning does not result from passive submission to total structure and direction from the teacher. The learning centers approach permits at least some elements of this active role to develop, and it encourages the continued growth of the necessary skills.

A further advantage of the learning centers approach derives from the ease with which it may be applied to instruction at virtually every grade and age level. With attention to the type of instructions and activities provided, the learning centers strategy may be employed from kindergarten through high school and, theoretically, beyond. As the ability of students to work independently grows, the complexity of the tasks and experiences presented at the learning center may be increased proportionately. In the earliest years children may go to the center for educational games, art and music activities, and other experiences which demand less skill in reading. As the age of pupil increases, directions and tasks may be made increasingly demanding.

One of the most attractive aspects of the learning centers approach is the provision made for eliminating the need for uniform seat work, which teachers have been pressed to use as a group management technique. With a room full of students, teachers who needed to work with small groups have often had no alternative to such "holding work" as a method of keeping students quiet and in their seats. The focus of this kind of instruction was obviously control, rather than learning. The

learning centers approach makes it possible to avoid the worst abuses of these assignments.

The learning centers approach is well adapted to the framework of team teaching. Teachers on a team may plan, construct, and implement centers together; or they may each be responsible for centers in a certain subject area or skill.

Interdisciplinary units initiated by a team of teachers are especially suited in the use of learning centers. A team of four teachers who represent language arts, social studies, science and math might, for example, cooperatively design and implement a unit or topics such as Ecology or Latin America or The American Dream. Such a center would be available to all students taught by the team. (The reader should turn to the Appendix for diagrams and notes illustrating a variety of situations to which the learning centers approach can be adapted.)

In a related area, the learning centers approach employs the services of paraprofessionals in a valuable way. Aides may be used in the construction of centers, as center facilitators, record keepers, question-askers, or any of a dozen other tasks.

Another advantage of the learning center is the relative ease with which it may be implemented. Centers can be implemented as the total instructional strategy or for any part of the school day. If the teacher chooses, it may be implemented in small steps as the teacher and students become familiar with the new process. This is particularly advantageous for teachers who have found other effective methods and have no desire to abandon them totally for an untried technique.

For teachers who are struggling for a realistic way to facilitate student thinking at higher levels, this strategy provides a way to apply the guides to those processes developed by Bloom, Taba, Hughes, and others. It also allows the teacher to plan her questioning in advance permitting an often striking improvement in the kinds of thinking asked of students in classrooms.

Centers allow students more physical freedom when used in either open space or traditional school facilities. And, since the teacher is free of the burden of holding the attention of the class on the front of the room, the movement is much less disturbing to learner and teacher. Students move from point to point, to and from teacher conferences, bathroom, etc., with little or no notice.

Centers facilitate more personalized instruction for every

student. In addition to student decision-making and individualized pacing of study, the learning center builds toward more individual contact between student and teacher permitting the development of a personalized relationship with the teacher so difficult to obtain in today's schools. Teachers freed of the obligation of continual lecturing and other "one-person techniques" have more time for attention to individual needs and learning styles.

The learning center, therefore, makes the one-to-one relationship the basic organizing construct of the school. In a very real sense it permits increased "multiple person contact" for our students, a valuable thing in today's increasingly compartmentalized, impersonal society.

Perhaps most important of all, it allows what the teacher does to be based on the individual learner's learning needs. It makes what we know about children the primary source of curriculum and instruction. The nature of society and the nature of knowledge become secondary sources. It, therefore, enhances the quality of human interaction in the school by moving teachers toward being facilitators of learning and children toward being active deciders of their own direction.

Finally, the learning centers approach provides opportunity for student self-evaluation. Each well-constructed center should contain an evaluation process which can be done by the student and checked later by the teacher or aide.

It is, perhaps, important to point out that the learning centers approach is like other instructional strategies in that it does not guarantee the accomplishment of the advantages described here. It allows them to be achieved only permitting that effort be expanded. There is no guaranteed, teacher-proof method of instruction.

How Do I Get Started?

The first step in creating learning centers for the classroom involves some decision-making by the teacher or teachers involved. Teachers must first decide what the role of the learning center will be in their instructional program. Will they be used for remediation, enrichment, motivation, short courses, or as the

major instructional strategy? Will learning be used throughout the day or for a shorter portion of the day? Will they be used for all subjects, a few, or only in an interdisciplinary unit? There must be, in other words, some basic procedural decisions made prior to the first move toward construction of centers. The same detailed planning that must accompany any other method of instruction must also be present for learning centers to be successful.

The writers recommend that teachers interested in using learning centers begin by using this approach for only one subject area or for a few hours out of the day or week. In this way the teacher can slowly change the method of instruction with the least amount of disruption and confusion.

Once the teacher has determined the extent to which learning centers will be used, teacher and students may plan the identity of the centers. Such teacher-student planning is crucial to the use of learning centers, as in every method. It is very important that learning centers are appropriate for the intended population. Centers may focus on a subject area (e.g., long division), a problem or issue (e.g., censorship), a "process" such as cooperating, or a variety of other topics. The most important consideration, however, is that they be planned with the student's interests in mind.

While the scope of a particular learning center will vary greatly with topic and age level, a good rule of thumb is that from beginning to end the student ought to be able to complete the activity in no less than one hour and no more than five. When a center offers an activity of less than one hour, creation of new centers becomes a pressing burden on the part of the teacher. When the activity demands more than the effort of a total day or of a week when worked at one hour a day, students tend to lose sight of the original objectives and to become less interested in completion of the task.

When constructing the learning centers, there are a number of other considerations to be weighed. Each center should, for example, contain activities at a variety of ability levels. Each center should provide alternative avenues for completing the activity whenever possible. Each center should provide activities which demand a variety of levels of student thinking, especially those levels of mental operations beyond pure memory.

Center Directions

Directions for using the learning center, in the form of a "Center Guide," are helpful when they are available for each student. The form presented below has proven successful for center guides in individualized, content-focused centers. Other types of format might be more appropriate for other centers and objectives. An elementary school art center or a middle school level, where games are used to reinforce new concepts, may need only a very simple, relatively permanent center guide.

LEARNING CENTER STUDY GUIDE

Part One: Introduction

1. An overview of the purposes activity of the center
2. Prerequisites for successful completion
3. Directions for completing the station must be very complete. A "flow chart" is often helpful

Part Two: Objectives

1. General goals and expected outcomes(s).
2. Specific behavioral objectives

Part Three: Preassessment

1. A pre-test that the student may use to determine whether he will profit from a particular activity. If he passes the pre-test he may proceed to another center or other pre-determined activity (e.g., independent study).

Part Four: Learning Activities

1. Specific learning activities for each objective specified in part two. There should be several alternative activities for each objective.

Part Five: Post Assessment

1. A self-administered (when possible) device which tells the student how successful he has been.
2. Ideally, the results of the post-assessment should suggest which parts of the center the student should go ahead or back to.

Part Six: Materials—All the materials necessary to use the center.

Once the basic activity of the learning center is ready, the teacher should locate the part of the classroom where the center may be most appropriately located. Physical arrangements necessary for some activities need to be considered. Learning centers with activities calling for art work will need to be located near a sink while math activities might need to be located near a chalkboard. At this point the teacher will want to provide seating and writing space at each center. Except in very large classrooms, seating need not be rearranged for large group work. (See Appendix for setting up Learning Centers in various organizational arrangements and under various space conditions.)

Whether there is one center or a dozen, the teacher must provide some plan for student movement and share it with the class. Classroom "traffic" may be determined entirely by pupil interest, by time span, or a combination of factors. For example, in a self-contained elementary classroom the teacher might want to provide centers for everything but certain reading activities which she directs in a series of small groups. In this classroom each student might be identified with a particular reading group letting his interests or a teacher-student "contract" determine the direction and pace of his other learning experiences. Student movement from center to center in this classroom would be a function of reading group schedules.

Once the overall pattern of pupil movement has been determined, teachers and students are able to begin what must become a continuing process throughout the life of the learning center in the classroom. Together, the teacher and each pupil diagnose the pupil's needs and interests in various areas and develop appropriate plans for each day and week. Decisions are made concerning which centers will be visited, what tasks will be accomplished, when the student will join a small group meeting with the teacher, and when the next teacher-pupil conference will be held.

The students are now ready to begin working at the centers. In accordance with teacher directions and previously laid plans, pupils choose centers and activities appropriate for them. The teacher becomes a facilitator or learning rather than the verbal funnel through which a stream of facts is poured into passive

receptacles. Working with individuals and small groups, the teacher is able to make the individual contact and interventions that are the ultimate test of personalized instruction.

When the pupil completes work at a particular center, he submits a post-assessment to his file for the teacher to examine. He then proceeds to a new task or center in line with the terms of his contract. At the earliest opportunity the teacher evaluates the post-assessment and decides, perhaps in conference with the pupil, where the pupil goes from here—a new center, small group instruction, back to the first center for remediation, etc.

When students are at work in learning centers, the teacher uses his time in several ways. One of these is, of course, to continue to be available for individual conferences, skill work, and introducing new concepts to small groups. In addition, the teacher continues her evaluation of group progress and plans new centers or activities in anticipation of future student needs or interests.

Further Guidelines

There are a number of questions a teacher should ask herself when planning a learning center. They are:

1. What will be the theme or focus of the center?
2. What specific objectives for students' learning should the center's activities achieve?
   —skills and capabilities
   —concepts
   —attitudes
3. What activities and materials might be most appropriate to the achievement of the objectives?
4. How will records of students efforts be kept? Who will keep them?
5. What assessment procedures will be used to determine student achievement?
6. How well will the center work?
   a. Will it capture students' interests?
   b. Will it maintain students' involvement?
   c. Will the directions be clear and easy to follow?
   d. Will it encourage extensions of learning activities by the students?
   e. Will the center result in a display of students' work?

Could You Give An Example?

A group of students has become interested in flight. Their teacher wishes to tap this interest for interdisciplinary study which develops math, science, and social studies as well as language skills. The following description of the center designed to promote such study is intended as an illustration of the process of center building. The questions listed above are taken in turn and answered in order to provide an example of how they might be used as guidelines.

The Center's Theme: A Study of Flight

Objectives for the Major Focus of Students' Learnings:

—To enable students to raise questions about flight, collect data, and find answers to the questions.

—To develop skills of recording collected data (keeping observational reports and making charts and graphs).

—To encourage students to express their thoughts and feelings about flight through language and art media.

Activities:

The activities described here present a variety of possibilities for learning. The depth of each would, of course, have to be adjusted to the level of maturity of the children.

Exploring Bird Wings

Materials: Bones from chicken wings (obtained by boiling, scraping, and drying the bones from the wings of broilers or fryers)
Specimens of bones from bird wings obtained from a local museum or the Audubon Society
Pan balance scale
Tape measure

Sets of chicken wings bones are contained in bags labled: "Bag of Bones." These are accompanied by instructions such as:

1. Look at the bones in the bag. Feel them. What animal do you think they come from? What are they used for?

(Older children may discuss their answers to the questions with one another. Pictures showing bone formations of various body parts in animals and man may be put on display to assist the children in identification. Younger children may be asked to match the chicken bones to pictures and diagrams of bones from different animals for identification. Envelopes containing the correct answer may be made available to the students after identification is attempted.)

2. Having identified the bones as chicken wings, the students may be directed to explore the question: Why can't chickens fly?
   a. Use the tape measure to measure the chicken bones. Record the length of each on the chart. Do the same thing for the bones of other birds on display.

Length in Inches/Centimeters

	Bone No. 1	Bone No. 2	Bone No. 3	Bone No. 4
Chicken				
Robin				
Seagull				
Falcon				

   b. Weigh the bones of each bird. Record the weight on the chart.

Weight in Ounces/Grams

	Bone No. 1	Bone No. 2	Bone No. 3	Bone No. 4
Chicken				
Robin				
Seagull				
Falcon				

   c. What differences do you find between the length and weight of chicken wing bones and the wing bones of flying birds?

Depending on the age of the students, questions and directions may lead them to measure the length, width, and weight of bones in varied ways, using different units of measurement. Further, students may be asked to graph, in histogram form, the data they collected from measurement activities. Even young children may be able to make histograms to compare and contrast

the length of bird bones by cutting strips of paper the length of each bone to paste side by side on construction paper backing.

Other activities with chicken wing bones might include:

—sketching bone structure.
—stringing bones to recreate wing form.
—researching the number of bones in various parts of the bodies of animals and humans.
—exploring mystery bone bags which contain bones from various animals and the human body. Students might create their own mystery bone bags for one another to inquire into.

Making and Testing Paper Airplanes

Materials: Paper of various weights such as tissue, newspaper, bond, construction paper, and oaktag
Stopwatch
Measuring Tape
Patterns of different types of paper airplanes such as those contained in:
Mander, Jerry, George Dippel, and Howard Gossage. *The Great International Paper Airplane Book.* New York, N.Y.: Simon and Schuster, 1967.

The materials are displayed with examples of paper airplanes and patterns for making a variety of types with instructions such as:

a. Choose a type of paper airplane to make. Find the pattern.
b. Make an airplane using at least three different types of paper. Give each airplane a number.
c. Test the airplanes you have made to see how long they stay in the air (airborne time) by using the stopwatch. Record your findings on the chart.

Airborne Time of Paper Airplanes

	Airplane No. 1	Airplane No. 2	Airplane No. 3
Time in Air			
Trial 1			
Trial 2			
Trial 3			

d. Using the tape measure, mark the launch site. Find the distance each plane flies by measuring from the launch site to the landing site. Record this on your chart.

Distance Traveled by Paper Airplanes

	Airplane No. 1	Airplane No. 2	Airplane No. 3
Distance Traveled			
Trial 1			
Trial 2			
Trial 3			

e. Compare airborne times and distance traveled by the airplanes you made. Which stayed in the air longest? Covered the greatest distance? Why?

f. Try adding and subtracting parts from your airplanes. Test them again for airborne time and distance flown. Add this information to your chart.

g. Graph the airborne time for the two planes which were most different in ability to fly. Why do you think they were so different?

Additional activities with paper airplanes might include:

—experimentation with simple paper airplanes with the recording of data through paintings and dictated captions or experience stories.

—building balsa wood gliders to test for airborne time and flying distance. (This could lead to research on wing structure of birds and airplanes and the influence of air pressure on flying capabilities.)

—studying the historical development of airplanes and man's quest for flight.

—creative expression through writing and art about things that fly and the feeling of flight.

—written and oral reporting of experiences and experiments with paper airplanes and balsa gliders.

—making slides of the process of folding and testing the paper airplanes along with a tape recorded narration giving instructions on how to do it.

—making books which contain samples and/or pictures of airplanes created along with captions or experience stories.

Listening and Viewing Area

This part of the center might include a variety of visual and auditory materials and activities designed to stimulate students' expression of ideas and emotions. The following activities are representative examples:

1. Slides and Guides
   a. A series of slides depicting various situations of birds and men in flight could be set up using a carousel projector and a simple, small homemade screen or a handviewer. Students may be carefully directed in their viewing by study guides containing fairly specific questions. Or they may be asked to look and react in more open-ended ways.
   b. A variation of the above could be the addition of music for a multi-media presentation on flight. Students would be guided to look and listen for specific things. Or as in "a," they may be asked to look, listen, and react in their own way.
   c. A third alternative might involve in depth exploration of one particular slide. Students again would respond to questions in a study guide format. These questions could focus on any or all of the levels of thinking from simple recall or "what do you see?" to questions which require divergent or evaluative thinking such as, "How would you feel if you were there?" (Slides might show real scenes or they may be made from pictures in books at relatively inexpensive cost. Films can also be used in the same manner.)
2. Listening and Looking
   A listening station could be set up in which taped excerpts from *Jonathan Livingston Seagull* are heard as students look at pictures from the book. A discussion of concepts such as freedom, power, and competence could then be held by groups of students as a follow-up activity.
3. Other possibilities for activities related to either of the above stimuli might include:
   a. Oral language development through discussion, role play, or creative dramatic activities depicting, for example, the life of Jonathan Livingston Seagull.

b. Writing activities such as stories about the slide pictures, the seagull, flight, the music, or other birds, flying objects, and space might be developed. Cinquain or haiku poetry could also be used as vehicles for student expression related to the above topics or others. Any number of brain-storming activities might aid in the expansion of vocabulary. For example, students might list all the words that describe their feelings about things they heard while experiencing the multimedia presentation.

c. Art activities using media such as paint, chalk, scraps for collage, crayons, pencil can be used as means for the expression of ideas developed from the listening and viewing stimuli. Construction is another possibility. Original birds could be created using any number of materials or, perhaps, students might wish to create the view from Jonathan's eyes or a diorama depicting some scene from the story.

Students can be encouraged to react to the original stimuli of visuals and sound in any number of ways. In this instance, almost anything goes because the intent is to facilitate students' expression of ideas and feelings using a variety of media and modes of expression.

Introducing the Center

Once the center's activities have been selected and prepared for student use, the teacher may wish to introduce the center to the total class, especially if students have little experience in working at centers. In addition to orienting the class to the activities at the center and determining who may do what, when, the teacher might conduct an introductory lesson on flight, perhaps using inquiry procedures and/or visuals. The idea is to acquaint students with the center's theme and generate their interest in working through center activities.

Records of Student's Work:

Flight Folders (to be put together by the child). The work completed for each activity will be included in each child's folder.

Checklists (to be kept by the teacher).

Objectives	*Student's Names*
Raising questions	
Collecting data	
Answering questions	
Keeping observational reports	
Making charts and graphs	
Expressing thoughts and feelings through language art media	
Comments	

The students working at the center over a number of days or weeks will be observed by the teacher who will focus attention on different students over time. When a student is observed to raise questions or do any of the things listed on the checklist, the date of that observation is noted under his name in the appropriate box.

Student Self-evaluations (to be completed by each student using a form for all activities and their products).

1. I think the work I did on this activity was:

   Good So-so Poor

2. If I were to do this activity again, I would improve my work by doing these things:
3. Another way I could learn about flight is by doing this:
4. I thought this activity was:

These self-evaluations would be completed for each activity, attached to the product of the activity, and placed in the student's Flight Folder.

Assessment of Student Achievement

The teacher may wish to use one or more of the following:

1. Examine work in students' folders to evaluate the degree to which objectives are being met.
2. Conference with students to review self-evaluation and checklist notations.
3. Assign an activity which requires students to use the skills and capabilities previously developed at the center. An example is:

   Design Your Own Flying Machine

   Teachers might ask students to create an original flying machine using any materials available at school or home. The following guidelines for completion of the project could be suggested:

   A. Design an original flying machine on paper. Develop a "blueprint". Check your design for the following:
      1. Does your machine have the parts necessary to fly? If not, what do you think is missing?
      2. How is it like other things that fly? How is it different?
      3. What will you need to construct it? List the materials.
      4. Estimate the "airborne time" and distance capacity for your machine. Record on a chart.

      Check these plans with your teacher. Revise if necessary.

   B. Make your flying machine. Show it to your teacher and other students discussing the risks you will be taking in attempting to fly it. Try it out keeping a record of the airborne time and flying distance. Compare with your original estimate. Try flying the machine several times. Make a chart or graph that will show the results of your flight. If you wish, compare the flying ability of your machine with another student's.

   C. Find a partner and switch machines. Using art, writing, or both, express your feelings and ideas about your own flying machine.

   —or—

Communicate, using any media, something about your own flying machine.

The process of designing, creating, and using the flying machine and recording the results should give the teacher a good reading as to the students' degree of objective achievement. In this process, it will be necessary to raise questions, collect data, answer questions, and record data. The final product will represent an expression of students' thoughts and feelings about flight.

Center Suitability

The teacher may wish to apply the following checklist to the evaluation of the center. In addition, student self-evaluation sheets can be examined for comments which reflect the success of center activities in promoting student involvement and learning.

1. Did the center capture students' interest?

/1	/2	/3	/4	/5
High				Low

2. Did it maintain students' involvement?

/1	/2	/3	/4	/5
High				Low

3. Were the directions clear and easy to follow?

/1	/2	/3	/4	/5
High				Low

4. Did it encourage extensions of learning activities by students?

/1	/2	/3	/4	/5
High				Low

5. Did it result in a display of children's work?

/1	/2	/3	/4	/5
High				Low

Summary

A learning center is always in process. It is not intended to become something static and final or to be reproduced in exactly the same way every time it is used. The foregoing description of a center has been offered to spark the teacher's thinking about possibilities for the design and use of centers at different levels of education, for different purposes, and with different learners. The richness of the center approach to instruction is dependent primarily on the teacher's imagination and ingenuity. The authors hope that the ideas, suggestions, and guidelines offered here will interest teachers in designing centers which tap and extend students' interests while promoting their learnings.

Learning centers are, of course, a valuable teaching tool. However, an over-reliance on this approach to instruction carries with it the same dangers as over-reliance of any other major instructional strategy. The most obvious danger is that an excessive use fails to offer students the necessary variety of classroom learning modes without which any school day may become an onerous chore.

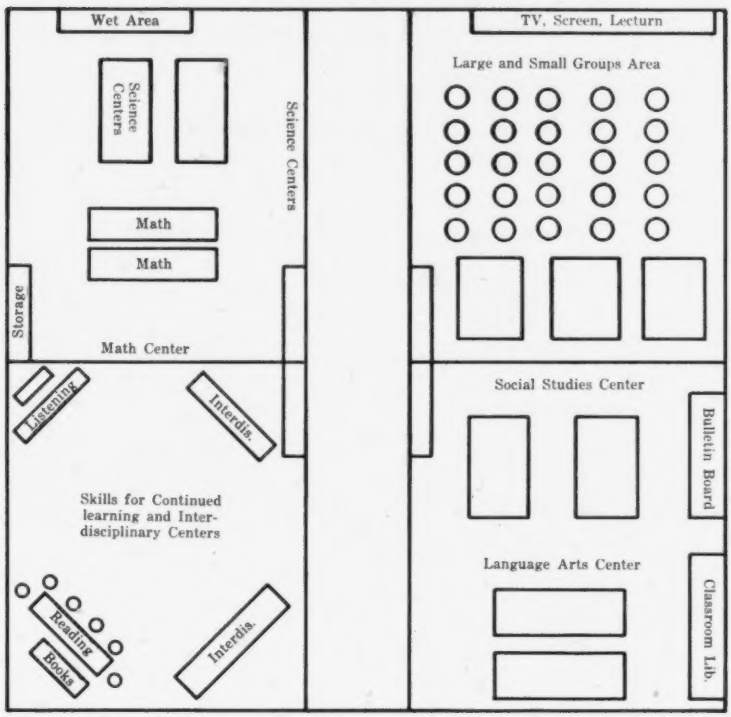
The alternative of total class instruction remains as a viable supplementary technique to complement the use of learning centers where the teacher recognizes an instructional need met more effectively in this way. When used as a change of pace, large group instruction becomes a more positive experience for teachers and students alike.

The students' learning styles must be the source of instructional techniques used in the classroom. While using this approach, however, the teacher has the opportunity to help the child develop the capacity to work effectively in other learning modes. The middle school student, for example, usually possesses the necessary skills for effective use of learning centers but finds it difficult or impossible to listen to verbal presentations. Using the learning center as the major instructional strategy gives the teacher the chance to introduce other methods in steps small enough to allow students to cope instead of being defeated by them.

The learning centers approach to instruction, when correctly understood and well-planned, can be used from kindergarten to college. In every classroom where personalized instruction is a major objective the learning center concept offers increased opportunities for individualization. As a result, it appears that in the years directly ahead the learning centers approach may be one of the small number of instructional innovations that attracts continued support rather than dust.

APPENDIX

Learning Centers for Teaming in a Traditional Building



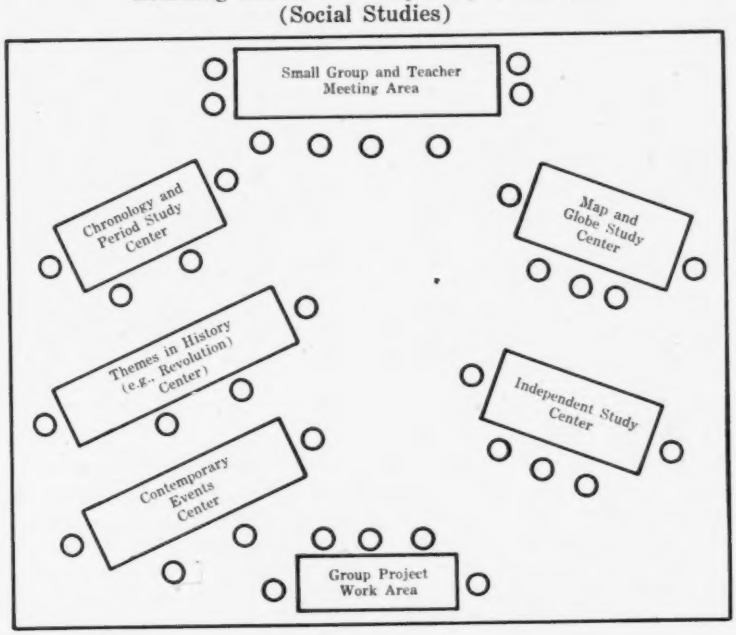
Note: Team teaching in a traditional building is adaptable to the learning centers approach. It is, quite possibly, easier to accomplish if the learning center approach is used. Student movement and ease of access may be handicapped, but the virtues of silence and privacy may compensate. Teachers and students may rotate on the same basis as they do in the open classroom. In the above diagram, four teachers

(or any number, really) can divide their responsibilities in a multitude of ways. Since mass movement of students can easily be eliminated by the proper use of the learning center, teachers may move from room to room or convene for brief planning sessions with ease.

A typical schedule for one student's day might look like this:

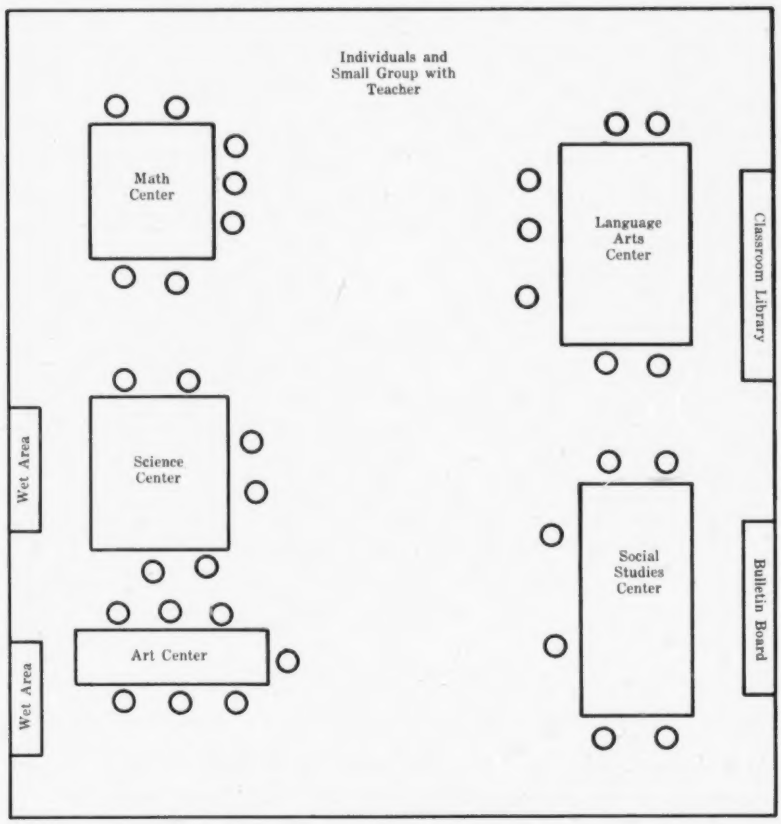
9:00 Finish work in language arts center
9:05 Conference with teacher on the team
9:20 Moves to science center
9:45 Attends film in large group area
10:15 Returns to science center and continues work on science module. Complete part one of new module
11:00 Goes to the reading center for some recreational reading time
11:30 Lunch
12:00 Meets in small group area with five other students who are also ready to complete social studies module by participating in an evaluative discussion
12:45 Physical education
1:00 Unified Arts
2:00 Independent study at an Interdisciplinary Center
3:00 Teacher conference
3:15 Dismissal

Learning Center in Disciplinary Classroom
(Social Studies)


Small Group and Teacher Meeting Area
Chronology and Period Study Center
Map and Globe Study Center
Themes in History (e.g., Revolution) Center
Independent Study Center
Contemporary Events Center
Group Project Work Area

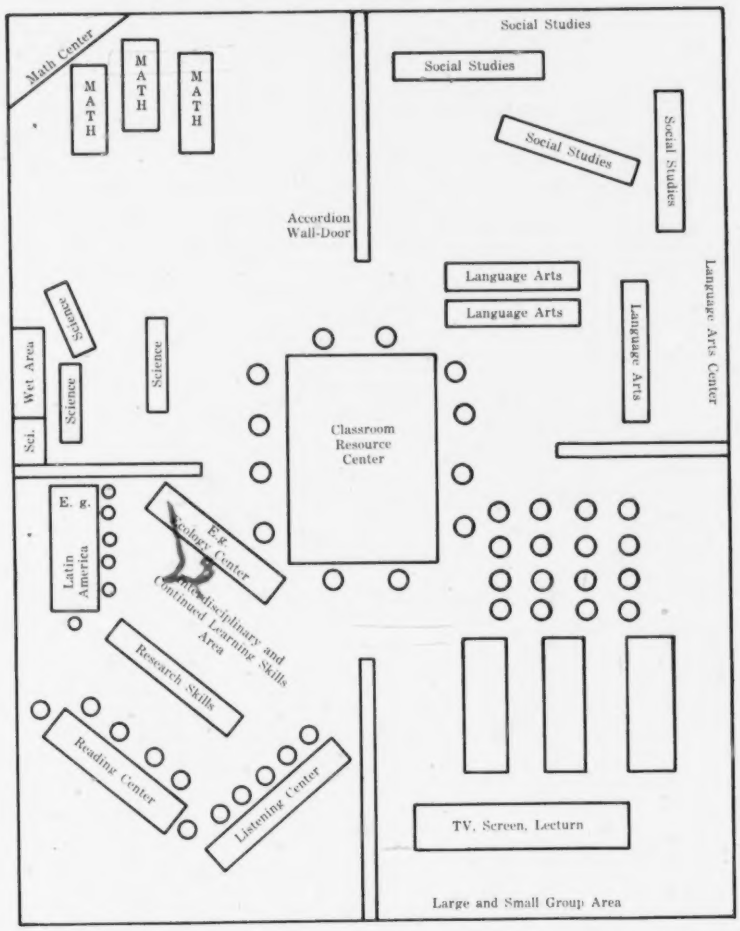
Note: The configuration and movement patterns in the traditional subject-focused classroom (middle school, junior or senior high, are not too different from the self-contained classroom. Students make contact with the teacher for individual work at the centers. Groups may gather in the appropriate area for cooperative project work. The teacher can plan conferences and small group work at the opposite end of the room. Large group instruction can utilize the whole room with students remaining where they are at the moment.

Learning Centers in Self Contained Classroom



Note: In the self-contained classroom students can move from center to center based on a predetermined scheme. The teacher works with individuals and small groups, and may move about the room making necessary interventions. Small groups may meet with the teacher for skill work, new concepts, etc., in the appropriate area.

Learning Centers in Open Space Team Area



Note: Using learning centers in the open space physical facility with a teaching team can take a number of shapes. One such arrangement is the open space area pictured above. The area contains centers focusing on the academic disciplines, interdisciplinary units, and the skills of continued learning. Many other types of centers (e.g., personal guidance) could be included.

In this situation the team may divide the responsibility for instruction in several ways. Teachers may work in the area of centers which fit their academic preparation. Following another strategy, they may rotate from area to area as the centers change identity. Or

they may assign themselves to areas on the basis of which teacher has large or small group teaching tasks to complete at the time. There are probably as many ways of working team assignments as a team desires to use.

BIBLIOGRAPHY

Books

Ashton-Warner, Sylvia, *Teacher*, New York: Simon and Schuster, 1963.

Featherstone, Joseph, *Schools Where Children Learn*, New York: Liveright, 1971.

Florida Department of Education. *Planning Creative Activities for Independent Learning*, B-2 Module.

Metropolitan Nashville Public Schools. *What About Learning Centers?* Nashville, Tennessee: Metropolitan Public Schools, 1969.

Murrow, Casey and Vega. *Children Come First.* New York: American Heritage Press, 1971.

Noar, Gertrude. *Individualized Instruction: Every Child a Winner.* New York: John Wiley and Sons, 1972.

Rapport, Virginia (Ed.). *Learning Centers: Children on Their Own.* Washington, D. C.: Association for Childhood Education International, 1970.

Stahl, D. K. and Anzalone, P. K. *Individualized Teaching in Elementary Schools.* West Nyack, New Jersey: Parker Publishing Co., 1970.

Voight, Ralph C., *Invitation to Learning: The Learning Center Handbook.* Washington, D. C.: Acropolis Books, 1971.

Williams, Lois E. *Independent Learning in the Elementary School Classroom.* Washington, D. C.: American Association of Elementary—Kindergarten—Nursery Educators, NEA, 1969.

Papers

Hunter, Madeline, "Individualized Instruction," in *Innovations in Elementary Schools*, and I/D/E/A Occasional Paper, The Institute for Development of Educational Activities, Inc., 1970.

I/D/E/A Occasional Paper. *Innovations in the Elementary School.* Report of a National Seminar, 1971.

I/D/E/A Occasional Paper, *The British Infant School.* Report of an International Seminar, 1971.

I/D/E/A Occasional Paper, *The Open Plan School*, Report of a National Seminar, Educational Facilities, 1970.

Journals

Berson, Minnie, "Inside the Open Classroom" *American Education*, v. 7, 4 (March, 1971) p. 11.

Billings, Zelpha W., "Self-Selection Classroom." *Today's Education.* 59 (Oct. 1970) p. 11.

Gross, Beatrice and Ronald Gross. "A Little Bit of Chaos," *Saturday Review*, (May 16, 1972) p. 71.

Mattleman, Marciene, "Beginning an Activity Centered Classroom", *The Reading Teacher, 25,* (February, 1972) pp. 424-429.
Silberman, Arlene. "A Santa's Workshop for Teachers," *American Education,* (Dec., 1971), p. 3.
"Learning Spaces—Activities and Specifications" *Audiovisual Instruction,* October 1970. EJ 028 287.
"Open Education: Bibliography: Books, Films, Suggested Resource People" *Nation's Schools,* May 1971. EJ 038 282.
"The Emphasis is on Learning—Not Instructing" *School Management,* August 1971. EJ 042 631.
"Open Education" *Instructor,* August/September 1971. EJ 032 382.
"Providing a Learning Environment" *Compact,* August 1971. EJ 042 442.
"Patterns for Change" *Grade Teacher,* November 1971. EJ 044 113.
"Creating a Climate for Individualizing Instruction" *Young Children,* October 1971. EJ 044 511.
"Out In the Open" *Monday Morning,* Spring 1971. EJ 039 316.
"Classroom Techniques: Individualized Work Centers: An Approach for the Elementary Retarded Child" *Education and Training of the Mentally Retarded,* February 1971. EJ 033 441.

ERIC

The following sources were suggested by a recent ERIC search and are available in most libraries on microfiche:

Ed 048 669	Comparison of Instructional Practices in Classrooms of Different Designs
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